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A REVIEW ON COMPARATIVE STUDY OF YOGA AND AEROBICS EXERCISE

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ABSTRACT

This article reviews the comparative studies on the effects of yoga and aerobics on the emotional states--anxiety, depression and mood. The analyses of correlational and experimental studies reveal positive effects of exercise, in healthy people and in clinical populations (also in patients with emotional disorders) regardless of gender and age. The benefits are significant especially in subjects with an elevated level of anxiety and depression because of more room for possible change. The most improvements are caused by rhythmic, aerobic exercises, using of large muscle groups (jogging, swimming, cycling, walking), of moderate and low intensity. They should be conducted for 30 minutes and performed a minimum of three times a week in programs of 10-weeks or longer. The results confirm the acute effect of exercise i.e. the reductions in anxiety and depression after single sessions of exercise. The changes in anxiety, depression and mood states after exercise are explained most frequently by the endorphin and monoamine hypotheses.

The studies comparing the effects of yoga and exercise seem to indicate that, in both healthy and diseased populations, yoga may be as effective as or better than exercise at improving a variety of health-related outcome measures. Future clinical trials are needed to examine the distinctions between exercise and yoga, particularly how the two modalities may differ in their effects on the SNS/HPA axis. Additional studies using rigorous methodologies are needed to examine the health benefits of the various types of yoga.

Introduction

In [1] Authors considered an acceptable method for improving and maintaining physical and emotional health. A growing body of evidence supports the belief that yoga benifits physical and mental health via down regulation of the hypothalamic–pituitary–adrenal (HPA) axis and the sympathetic nervous system (SNS). The purpose of authors is to provide research studies comparing the effects of yoga and exercise on a variety of health outcomes and health conditions.

Methods they were using PubMed! and the key word "yoga," a comprehensive search of the research literature from core scientific and nursing journals yielded 81 studies that met inclusion criteria. These studies subsequently were classified as uncontrolled (n ¼ 30), wait list controlled (n ¼ 16), or comparison (n ¼ 35). The most common comparison intervention (n ¼ 10) involved exercise. Results they have found In the studies yoga interventions appeared to be equal or superior to exercise in nearly every outcome measured except those involving physical fitness.

The studies comparing the effects of yoga and exercise seem to indicate that, in both healthy and diseased populations; yoga may be as effective as or better than exercise at improving a variety of health-related outcome measures. Future clinical trials are needed to examine the distinctions between exercise and yoga, particularly how the two modalities may differ in their effects on the SNS=HPA axis. Additional studies using rigorous methodologies are needed to examine the health benefits of the various types of yoga.

In [2] According to authors yoga-based interventions may prove to be an attractive option for the treatment of depression. The aim of this study is to systematically review the research evidence on the effectiveness of yoga for this indication Methods they used Searches of the major biomedical databases including MEDLINE, EMBASE, CINAHL, PsycINFO and the Cochrane Library were conducted. Specialist complementary and alternative medicine (CAM) and the IndMED databases were also searched and efforts made to identify unpublished and ongoing research. Searches were conducted between January and June 2004. Relevant research was categorized by study type and appraised. Clinical commentaries were obtained for studies reporting clinical outcomes. Results: Five randomized controlled trials were located, each of which utilized different forms of yoga interventions and in which the severity of the condition ranged from mild to severe. All trials reported positive findings but methodological details such as method of randomization, compliance and attrition rates were missing. No adverse effects were reported with the exception of fatigue and breathlessness in participants in one study. This study has Limitations No language restrictions were imposed on the searches conducted but no searches of databases in languages other than English were included. Overall, we can say that the initial indications are of potentially beneficial effects of yoga interventions on depressive disorders. Variation in interventions, severity and reporting of trial methodology suggests that the findings must be interpreted with caution. Several of the interventions may not be feasible in those with reduced or impaired mobility. Nevertheless, further investigation of yoga as a therapeutic intervention is warranted.

In [3] According to authors the impacts of yoga and aerobic exercise on level of concentration and change in feeling-states were examined in this study. They hypothesis was that concentration and feeling-states would improve over a yoga and aerobic exercise session, but yoga, a combination of exercise and meditation, was expected to produce greater positive changes than aerobic exercise. Participants included 70 students from Roger Williams University, 27 male and 43 female. 34 took part in 30 minutes of yoga and 36 took part in 30 minutes of aerobic exercise. Concentration levels and feeling-states improved significantly over sessions of both yoga and aerobic exercise sessions equally. Results indicate that aerobic exercise and yoga both produce positive changes in concentration, stress, energy, and well-being while only yoga produces improvements in mood and self-satisfaction.

“Psychological Perceptions To Walking, Water Aerobics And Yoga In College Students” a study utilizing a college sample compared psychological responses to yoga, water aerobics, and walking. Measurement variables included anxiety, exertion, pain, arousal, and mood. Anxiety was reduced for all modalities, with greatest reduction for water aerobics. Exertion was similar for all modalities suggesting all trials were of similar intensity. Pain was greatest for yoga when compared to the other modalities. Arousal was lowest after yoga and mood was more positive after walking and water aerobics. Results indicate that all modalities provide psychological benefit and institutions of higher education are encouraged to promote these types of wellness activities.

In [4] authors were reported nine experiments on the ability of people to perceive the distances reachable with handheld rods that they could yield by movements about the wrist but not see. An observed linear relationship between perceived and actual reaching distance with the rods held at once end was found to be unaffected by the density of the rods, the direction relative to the body in which they were wielded, and the frequency at which they were wielded. Manipulating (a) the position of an attached weight on an otherwise uniformly dense rod and (b) where a rod was grasped revealed that perceived reaching distance was governed by the principal moment(s) of inertia (I) of the hand-rod system about the axis of rotation. This dependency on moment of inertia (I) was found to hold even when the reaching distance was limited to the length of rod extending beyond and intermediate grasp an account is given of the haptic subsystem (hand-muscle-joints-nerves) as a smart perceptual instrument in the Runeson (1977) sense, character sable by an operator equation in which one operator functionally diagonalizes the inertia and strain tensors. Atunement to the in variants of the inertia tensor over major physical transformations may be the defining property of the haptic system. This property is discussed from the Gibsonian (ecological) perspectives of information as invariants over transformations and of intentions as extraordinary constraints on natural law.

Author were conducted nine experiments on the haptic capacity of people to perceive the distances of horizontal surfaces solely on the basis of mechanical stimulation resulting from contacting the surfaces with a vertically held rod. Participants touched target surfaces with rods inside a wooden cabinet and reported the perceived surface location with an indicator outside the cabinet. The target surface, rod, and the participant's hand were occluded, and the sound produced in

exploration was muffled. Properties of the probe (length, mass, moment of inertia, center of mass, and shape) were manipulated, along with the surface distance and the method and angle of probing. Results suggest that for the most common method of probing, namely, tapping, perceived vertical distance is specific to a particular relation among the rotational inertia of the probe, the distance of the point of contact with the surface from the probe's center of percussion, and the inclination at contact of the probe to the surface. They also suggest that the probe length and the distance probed are independently perceivable. The results were discussed in terms of information specificity versus percept-percept coupling and parallels between selective attention in haptic and visual perception.

In [5] Another author observed the perceptual size-weight illusion (SWI) occurs when two different-sized objects with equal mass are lifted in sequence : the smaller object is consistently reported to feel heavier than the larger object even after repeated lifting attempts. Here we explored the relationship between sensori motor and perceptual responses to a SWI in which the smaller of the two target objects in fact weighed slightly less (2.7 N) than the larger object (3.2 N). For 20 consecutive lifts, participants consistently reported that the small-light object felt heavier than the large-heavy object; however, concurrently measured lifting dynamics showed exactly the opposite pattern : peak grip force, peak grip force rate, peak load force, and peak load force rate were all significantly greater for the large-heavy object versus the small-light object. The difference in peak load rate between the two objects was greatest for the initial lift but decreased significantly beyond that point, suggesting that the sensor motor system used sensory feedback to correct for initial over-and underestimations of object mass. Despite these adjustments to lifting dynamics over the early trials, the difference between the judged heaviness of the two objects did not change. The findings clearly demonstrate that the sensor motor and perceptual systems utilize distinctly different mechanisms for determining object mass.

In [6] Author observed that individuals usually report for two objects of equal mass but different volume that the larger object feels lighter. This so called size-weight illusion has been investigated for more than a century. The illusion is accompanied by increased forces, used to lift the larger object, resulting in a higher initial lifting speed and acceleration. The illusion holds when subjects know that the mass of the two objects is equal and it is likely that this also counts for the enlarged initial effort in lifting a larger box. Why should this happen ? under microgravity, subjects might be able to eliminate largely the weight-related component of the lifting force. Then, if persistent upward scaling of the weight-related force component had been the main cause of the elevated initial lifting force under normal gravity, this elevated force might disappear under microgravity. On the other hand, the elevated initial lifting microgravity. On the other hand, the elevated initial lifting effort in the large box would be preserved if it had been caused mainly by a persistent upward scaling of the force component, necessary to accelerate the object. To test whether the elevated initial lifting effort either persists or disappears under microgravity, a lifting experiment was carried out during brief periods of microgravity in parabolic flights. Subjects performed whole-body lifting movements with their feet strapped to the floor of the aircraft, using two 8 kg boxes of different volume. The peak lifting forces declined almost instantaneously with approximately a factor 9 in the first lifting movements under microgravity compared with normal gravity, suggesting a rapid adaptation to the loss of weight. Though the overall speed of the lifting movement decreased under microgravity, the mean initial acceleration of the box over the first 200 ms of the lifting movement remained higher ($p = 0.030$) in the large box ($1.87+/-0.127$ m/s^2) compared with the small box ($1.47+/-0.122$ m/s^2). Under normal gravity these accelerations were $3.30 +/-0.159$ m/s^2 and $2.67+/-0.159$ m/s^2, respectively ($p = 0.008$). A comparable trend was found in the initial lifting forces, being significant in the pooled gravity conditions ($p = 0.036$) but not in separate tests on the normal gravity ($p = 0.109$) and microgravity ($p = 0.169$) condition. It is concluded that the elevated initial lifting effort with larger objects holds during short-term exposure to microgravity. This suggests that upward scaling of the force component, required to accelerate the larger box, is an important factor in the elevated initial lifting effort (and the associated size-weight illusion) under normal gravity.

In [7]Other have investigated skill-based differences in anticipation and visual search strategy within open-play situations in soccer. Experienced ($n = 15$) and inexperienced ($n = 15$) subjects were required to anticipate pass destination from filmed soccer sequences viewed on a large 3-m x 3-m video projection screen. MANCOVA showed that experienced soccer players demonstrated superior anticipatory performance. Univariate analyses revealed between-group differences in speed of response but not in response accuracy. Also, inexperienced players fixated more frequently on the ball and the player passing the ball, whereas experienced players fixated on peripheral aspects of the display, such as the positions and movements of other players. The experienced group fixated on significantly more locations than.

author used a novel methodological approach to examine skill-based differences in anticipation and visual search behavior during the penalty kick in soccer. Expert and novice goalkeepers were required to move a joystick in response to penalty kicks presented on film. The proportion of penalties saved was assessed, as well as the frequency and time of initiation of joystick corrections. Visual search behavior was examined using an eye movement registration system. Expert goalkeepers were generally more accurate in predicting the direction of the penalty kick, waited longer before initiating a response and made fewer corrective movements with the joystick. The expert goalkeepers used a more efficient search strategy involving fewer fixations of longer duration to less disparate areas of the display. The novices spent longer fixating on the trunk, arms and hips, whereas the experts found the kicking leg, non-kicking leg and ball areas to be more informative, particularly as the moment of football contact approached. No differences in visual search behaviour were observed between successful and unsuccessful penalties. The results have implications for improving anticipation skill at penalty kicks.

Authors examined the relationship between visual search strategy, selective attention, and expertise in soccer. Experienced ($n = 12$) and less experienced ($n = 12$) soccer players moved in response to filmed offensive sequences. Experiment 1 examined differences in search strategy between the two groups, using an eye movement registration system. Experienced players demonstrated superior anticipation in 3-on-3 and 1-on-1 soccer simulations. There were no differences in search strategy in 3-on-3 situations. In 1-on-1 simulations, the experienced players had a higher search rate, involving more fixations of shorter duration, and fixated for longer on the hip region, indicating that this area was important in anticipating an opponent's movements. Experiment 2 examined the relationship between visual fixation and selective attention, using a spatial occlusion approach. In 3-on-3 situations, masking information “pick up” from areas other than the ball or ball passer had a more detrimental effect on the experienced players performances, suggesting differences in selective attention. In 1-on-1 situations, occluding an oncoming dribbler's head and shoulders, hips, or lower leg and ball region did not affect the experienced players' performances more than the less experienced group. The disparities in search strategy observed in Experiment 1 did not directly relate to differences in information extraction. Experiment 3 used concurrent verbal reports to indicate where participants extracted information from while viewing 3-on-3 sequences. Experienced players spent less time attending to the ball or ball passer and more time on other areas of the display. Findings highlight the advantages of integrating eye movements with more direct measures of selective attention.

In [8]Author have Compared the ability between skilled performers and novices have been made for activities such as basketball, volleyball, tennis, squash, and badminton, but there is little work on team-handball which is not a well-recognized sport in North America. To examine a variety of perceptual, e.g. anticipation time, reaction time, and motor, e.g. throwing tasks, abilities of skilled and novice female team-handball players 13 First Division (skilled) and 10 recreational (novice) players (M age = 25.3 years) performed 2 laboratory activities (for measurement of anticipation time, reaction time and movement time) and 3 field tasks (for measurement of accuracy and speed of throwing abilities) in random order. Reaction time and movement time were collected during a unique team-handball motor activity. Analyses of variance with repeated measures on trial blocks indicated high mean proficiency for the skilled participants in reaction time and all field-throwing tests compared with the novice participants. These reliable differences in team-handball activities further support superiority in sport settings gained by physical achievements and psychomotor excellence. In other words, skilled female team-handball players threw faster and more accurately and responded more rapidly than novice players.

In [9] other experiment author observed that the time of occurrence and spatial location of the advance cues used to anticipate the direction and force of an opponent's stroke in squash were examined using a film task. This task, designed to stimulate the normal perceptual display of the defensive player, consisted of two discrete parts, each containing 160 individual stroke sequences (trials). In the first part of the film task, the display was occluded at different time intervals throughout the development of the opponent's stroke and the 16 expert and 20 novice subjects had to predict both the direction (down-wall or cross-court) and force advance cues was occluded by placing opaque mats on the film surface. Across all of the film task conditions experts were superior to novices in predicting the event outcome from the information available, highlighting the important contribution anticipatory skills make to expert performance in this sport. Analysis of lateral (direction) error showed that the most critical time periods for extracting information about stroke direction are the periods between 160-80 ms prior to racket-ball contact and the period of extended ball flight arising at least 80 ms after contact. Whereas both groups were attuned to this ball flight information, only the experts were capable of picking up information from the early part of the opponent's actions. This early information appeared to be provided by the opposing player's arm action. Similar time periods were found to be also important for the prediction of stroke depth, but in this case both experts and novices were similar in their cue dependence.

In this research author examined 13 skilled and 12 novice tennis performers' ability to use visual information of an opponent's movement pattern to anticipate and respond. In Experiment 1, skilled and novice players anticipated the type of stroke and the direction in which the ball was hit in a highly coupled perception-action environment. Both groups of players correctly anticipated at greater than chance levels. Skilled players were significantly more accurate than novices with live and video displays but not with point-light displays. In Experiment 2, the reaction latencies of 10 expert performers were significantly faster when they returned balls hit by a live opponent than when they returned balls projected from a cloaked ball machine. The findings indicate that experts are able to use move-

ment pattern information to determine shot selection and to use that information to significantly reduce their response delay times. The findings are discussed in terms of perception-action coupling in time-stress activities.

In [10]Author studied to examine the within-subject variability in heart rate, pedal rate, choice reaction time, and error rate during simultaneous tasks of cycling and reaction time. Students in physical education classes exercised a 10 min. sub maximal cycloergometer test at a relative power output corresponding to 60% of their own maximal aerobic power, in a replication procedure. Concomitantly, the subjects performed a 2-choice reaction time task from minimum 3 of the exercise bout. No significant differences ($p > 0.05$) were found between the individual means in the tests for the diverse parameters. The total intra individual variability averaged 1.3% for heart rate, 2.2% for pedal rate, and 13.3% for choice reaction time. Because wide within-subject variability was observed (from 7.7% to 16.7%), the reliability of choice reaction time was low. These data suggest that it is necessary ry quantify more accurately the intra individual differences of reaction time measures for the interpretation of exercise-changes in cognitive functioning.

Auhor examined the facilitating effects of physical exercise on the reaction process. Eleven participants with specific expertise in decision-making sports performed a choice reaction time task during moderate sub-maximal exercise (90% of their ventilatory threshold power). Participants were tested at rest and while cycling. During exercise, the participants were faster, without being more variable. We suggest that the effect of exercise on cognitive performance was due to a major generalized improvement of the whole distribution of response time and although the benefit effect was small, it was consistent throughout the entire range of reaction times.

In [11] Different author found that the laboratory measures of visual reaction time suggest that some aspects of high-speed ball games such as cricket are 'impossible' because there is insufficient time for the player to respond to unpredictable movements of the ball. Given the success with which some people perform these supposedly impossible acts, it has been assumed by some commentators that laboratory measures of reaction time are not applicable to skilled performers. An analysis of high-speed film of international cricketers batting on a specially prepared pitch which produced unpredictable movement of the ball is reported, and it is shown that, when batting, highly skilled professional cricketers show reaction times of around 200 ms, times similar to those found in traditional laboratory studies. Furthermore, professional cricketers take roughly as long as casual players to pick up ball flight information from film of bowlers. These two sets of results suggest that the dramatic contrast between the ability of skilled and unskilled sportsmen to act on the basis of visual information does not lie in differences in the speed of operation of the perceptual system. It lies in the organization of the motor system that uses the output of the perceptual system.

In [12] A group of authors studied to determine the sources of visual information used by highly skilled tennis players in anticipating their opponent's shots. In Experiment 1, motion analysis of the strokes showed that the relative motion between the racquet and forearm was different between the ground strokes and lobs, but there were no reliable kinematic differences when shot direction was varied. In Experiment 2, 12 skilled tennis players observed the opponent hitting strokes in a normal video or in a point-light display with different segments occluded. Players' anticipation accuracy was not degraded by the use of the point-light display. Occluding the racquet and forearm significantly reduced the participant's ability to determine the type of stroke produced.

In [13] Different authors studied to examine the facilitating effects of moderate physical exercise on the reaction process to gain a better understanding of the interaction between physiological and cognitive processes. Sixteen participants with specific expertise in decision-making sports performed a double task consisting of choice reaction time while cycling. Signal quality, stimulus-response compatibility and time uncertainty were manipulated. Participants were tested at rest and while cycling at 20% and at 50% of their maximal aerobic power. A mood assessment questionnaire and a critical flicker fusion test were administered before and after the choice reaction time task. The results showed that moderate-intensity exercise (50% maximal aerobic power) improves cognitive performance and that low-intensity exercise (20% maximal aerobic power) enables participants to compensate the negative dual-task effect.

Auhor examined the effect of attempting to exercise supra-maximally on reaction time and movement time in a non-compatible response time task. Subjects ($n = 9$) undertook a 4-choice non-compatible response time test at rest, while cycling at 70 rpm with a resistance of 35 W (low intensity exercise), cycling at 70% of their maximum power output (MPO), cycling at 100% MPO and attempting to cycle at 70 rpm, with a resistance that was 28 W greater than the resistance required to elicit MPO (supra-maximal effort). Reaction time, movement time, intra-individual variations in reaction time and movement time at each exercise intensity were compared by a series of repeated measures analyses of variance. A significant effect of exercise was shown for movement time, $F(4,32)= 6.05$, $p<0.001$, eta2 = 0.44, Power = 0.97 and intra individual variation in reaction time, $F(4,32) = 4.98$, $p<0.005$, eta2 = 0.38, Power = 0.93. For movement time, Tukey post-hoc tests showed that performance at rest was significantly slower than that during exercise at 70%, 100% MPO and supra-maximal effort. Performance at low intensity exercise was significantly slower than that at MPO. For intra-individual variations in reaction time, Tukey tests found that variations under supra-maximal effort and MPO were significantly greater than those at low intensity and 70% MPO. It was concluded that exercise facilitates speed of movement when the limbs used for the motor task are not the ones that are being exercised. Reaction time during maximal and supra-maximal exercise demonstrates large intra-individual variations.

Conclusion

The purpose of the study is to make comparison of yoga and aerobic exercise on selected psychological variables in engineering college student. It is an accepted fact that yoga and aerobics exercises are basic requirement and foundation to maintain the psychological variables stress and anxiety that is beneficial for any type of sports and healthy social living. Since, in every sports technical, tactical task and elements are distinctively different the nature and the level of stress and anxiety control ability will also be of different level.

We genuinely felt that which exercise plays a critical role to control the stress and anxiety more effectively. So it is required to be investigated in depth and detail to understand its implication and compare the yoga and aerobics very specifically for training and performance.

Considering above, we narrowed down the conceptualization of research on comparison of yoga and aerobics exercises on the basis of psychological variables stress and anxiety and keeping the primary objective of the research as prime focus. And the study is titled as "Comparative Study Of Yoga And Aerobic Exercise On Selected Psychological Variables In Engineering College Students".

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